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ABSTRACT

A dual purpose is served in this paper: The creation, organization, and preliminary success of a university/school collaboration are discussed, and the program is simultaneously posed as a model for adoption by other districts and their neighboring universities and colleges. The paper's introduction details the Oakland School District's problems in preparing minority (mostly black) students for college math courses; these problems led the Oakland School District to seek the assistance of the University of California, Berkeley, in 1980. Next, the program's research objectives and basic goals are stated: how it aims to affect the Oakland minority college-bound student, who is to be involved in the program's implementation and maintenance, and how long assistance will last before the schools attain autonomous, regular operation. The basic, three-part structure of the program is described and its goals for school autonomy are further elaborated. Past, present, and projected effectiveness and development is documented by charts, tables, and descriptive analysis showing preliminary and projected student enrollment, school involvement, and signs of acceptance and instutionalization. Concluding the paper is a rationalization of program costs, a funding history/cost summary table, and an appendix in which are collected brief, positive responses to the program from administrators, teachers, counselors, and parents. (KH)

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THE COOPERATIVE COLLEGE PREPARATORY PROGRAM:

A COMPREHENSIVE MODEL FOR SCHOOL CHANGE

An Interim Report

to

The Oakland Unified School District

and

The University of California, Berkeley

October 1982

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COOPERATIVE COLLEGE PREPARATORY PROGRAM (CCPP)

Executive Summary

The Cooperative College Preparatory Program was founded July 1980 to address the continuing underrepresentation of minorities at the University and, in particular, the declining number of Oakland minority students sufficiently prepared to enter college and study math-based fields. It is a project of the University of California, Berkeley and the Oakland School District created in response to a request by the District that the University assist selected secondary schools (grades 7-12) to strengthen their college preparatory math programs. Assistance is provided over a five-year period during which the number of students in the college preparatory program is gradually increased and the capacity of the schools to maintain this expanded program is developed.

CCPP provides a wide range of assistance in all areas of school operations according to the needs of individual schools. CCPP staff work with teachers, counselors, and administrators on a daily basis at the school site to: 1) strengthen curriculum and instruction in the college preparatory math courses, grades 7-12; 2) develop methods of identifying talented students in grades 7 and 8; 3) strengthen management, counseling, and enrollment practices; 4) provide instructional support for students in class and in study groups; and 5) develop methods for building and sustaining parent involvement. Assistance at individual schools is complemented by a School-University Institute, at which school faculty and staff, District staff, parents, and University staff meet regularly to identify problems, to plan solutions, and to share information and successful practices. CCPP staff assist in the follow-up work required to implement plans formed at the Institute at the school sites.

CCPP operates in all eight secondary schools in East Oakland: Castlemont and Fremont High Schools and the six junior high schools in their attendance

areas: Elmhurst, Frick, Hamilton, Havenscourt, King Estates, and Madison.

Preliminary evaluation results suggest that the program is working successfully toward its goals. There are indications that courses have been strengthened and standards raised and, at the same time, approximately twice as many students are taking advanced courses on each grade level. The number of 7th graders taking college preparatory math in the six junior highs combined rose from 165 (12.1% of all 7th graders) in June 1981 to 360 (22.2%) in September 1982 (pre-enrollment). Over the same period, the number of 8th graders taking college preparatory math rose from 178 (12.6%) to 335 (22.2%) and the number of 9th graders taking algebra rose from 114 (8.7%) to 250 (19.0%). At the two high schools combined, over the same period, the number of 10th graders taking geometry rose from 36 (2.8%) to 90 (7.5%), the number of 11th graders taking advanced algebra/trigonometry rose from 21 (1.9%) to 45 (4.8%), and the number of 12th graders taking pre-calculus rose from 3 (.4%) to 22 (2.3%). It is estimated that in 1985-86, the two high schools combined will yield 102 students taking pre-calculus in the 12th grade and 77 entering college prepared to take college calculus. At this time, it is also expected that the two schools will yield an additional 100 students taking advanced algebra/trigonometry in the 12th grade who will be eligible for college.

Program costs 1980-81 ($190,500) were provided by the University of California Regents Opportunity Fund. Program costs 1981-82 ($300,000) were provided by the UC Regents Opportunity Fund ($263,500) and the San Francisco Foundation ($36,500). Program costs 1982-83 ($318,500) are being provided by UC Berkeley ($245,000), the San Francisco Foundation ($63,500), and the Bechtel Corporation ($10,000).

Oakland has committed itself to a gradual expansion of CCPP. An initial allocation of $10,000 by the District in 1982-83 will be aimed at training teachers, counselors, and administrators to implement CCPP methods and to maintain the program.

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INTRODUCTION

The Cooperative College Preparatory Program was founded in July 1980 to address the continuing underrepresentation of minorities at the University and, in particular, the declining number of Oakland minority students sufficiently prepared to enter college and study math-based fields. It is a project of the University of California, Berkeley and the Oakland School District created in response to a request by the District that the University assist selected secondary schools (grades 7-12) to strengthen their college preparatory math programs. Assistance is provided over a five-year period during which the number of students in the college preparatory programs is gradually increased and the capacity of the schools to maintain these expanded programs is developed.

The Diminishing College-Bound Population

The need for this kind of comprehensive assistance emerges in the 1980-81 college preparatory math course enrollments of the two high schools and six junior high schools in which CCPP is working (see Figure 1, p. 15). Of the 1,304 9th graders in the junior highs, 114 (8.7%) took algebra. At the high schools, a total of 36 out of 1308 (2.8%) 10th graders took geometry, 21 out of 1095 (1.9%) 11th graders took advanced algebra/trigonometry, and 3 out of 819 (.4%) 12th graders took pre-calculus. At one of the high schools only 3 of 680 10th graders were prepared to take geometry. At the two high schools, there were virtually no students progressing toward being prepared to take calculus in their first year of college. Furthermore, no more than 21 students at both schools combined were in a position to complete advanced algebra/trigonometry by the 12th grade and thus take pre-calculus in their freshman year.

At best, these schools were producing a very few students who could conceivably pursue math-based careers. Once in college, these few would have to make up at least one year of math before initiating study in their major field and would require additional instruction and assistance from campus support services to fill remaining gaps in their basic training. If this trend persisted, these schools would undoubtedly reach a point where they could no longer offer a full or realistic college preparatory program. The most devastating implication of such a trend would be that while the number of minority students in the state is rising, the number of minority students qualified to enter the University and to major in math-based fields would decrease.

The Interlocking Nature of the School Problems

A number of interrelated problems have contributed to the overall weakening of the curriculum and erosion of the math course enrollment evident in these low enrollment figures.

Most centrally, it has been difficult to teach the complete math curriculum because the levels of students' skills and abilities in the college preparatory classes tend to differ widely. In the process of addressing the students' varying deficiencies, teachers tend to fall behind and are almost always prevented from covering all of the required course content. At the same time, teachers teaching the same or sequential courses have not had adequate time to coordinate their adjusted efforts, so that continuity of course content has not been maintained and the curriculum has slowly moved in different directions. As a result, students who are prepared to take a course on one level move on to the next level with gaps in their backgrounds, building up an increasing deficit year by year. Eventually, course titles misrepresent what is being taught and grades become difficult to interpret

because it is not really known what they are measuring. At this point we say "standards have dropped." From the point of view of instruction, the problem that has developed is how to teach the required curriculum while at the same time filling in gaps in the students' preparation that prevent them from learning this curriculum.

The erosion of the curriculum is further exacerbated by three conditions that lead to students being placed in courses they are unprepared to take: 1) a lack of efficient and comprehensive methods for identifying talented students, 2) a lack of sufficiently refined procedures for grouping and enrolling students, and 3) policies requiring minimum class size. The following situation typifies these interlocking problems. A school wants to offer a college preparatory course, but existing methods cannot identify enough qualified students. In order to meet the requirement for minimum class size, unqualified students are enrolled in the course. At each level these heterogeneous classes intensify already existing problems of identification, counseling, and grouping of students. All of these problems in turn accelerate erosion of the curriculum and prevent development of the pyramid of prepared students.

Two other factors compound the problem: 1) the lack of trained math teachers, and 2) pressures to consolidate teaching staffs. Together, these factors have resulted in the assigning of some inadequately trained teachers to teach math courses. These teachers tend to avoid teaching curricula they are not sure of and tend to find it difficult to adapt curricula to meet the wide range of needs of their students. In addition, some tend to transmit their own negative attitudes toward math to the students. Rather than pushing their students to learn math, they tend to foster their students' inclination to avoid it.

Finally, all of these problems are intensified by district open enrollment policies. As the curriculum weakens and a school develops a negative academic image, the best students attend stronger schools. These conditions set in motion a destructive trend: as the already academically weak schools lose their most capable students, their capacity to offer a strong program and to attract good students is diminished even further.

Requirements for Reversing the Trend:
Raising the Level of Steady-State Operations

Each school experiences these problems in different combinations and to different degrees. The mutually reinforcing nature of the problems, however, dictates that each school must identify its problems and then make a comprehensive effort to address them simultaneously. This comprehensive effort is required because solutions aimed at one or two problems in isolation will tend to be undermined by the other problems which contribute to them. It is also required because these problems did not arise overnight. They have accumulated and fed off each other over a long period of time and, to a degree, have become institutionalized. They have been perpetuated by the practices that have evolved as individual schools have tried to address them over the years in the context of a system unable to respond to them fast enough or at a sufficiently comprehensive level. Boosting the schools to a high level of operation while fighting institutional inertia and the momentum of the downward spiral demands nothing less than a comprehensive effort by everyone who works at the school.

Such an effort is a complex and difficult matter, and some schools need assistance to get started. In a sense the schools have all they can do to maintain their steady-state operations. Initiating a process of change that would direct resources away from existing operations is extremely difficult. Furthermore, guiding the school through a long-range change process requires

different skills and makes different demands on teachers and staff from those involved in simply maintaining school operations. This process will almost certainly require time, temporary reassignment, or increased or shifted responsibilities for teachers and staff; the reorganization and redistribution of internal resources; the development of additional resources; and training.

CCPP was conceived as a means whereby the University could assist the schools to initiate and to follow through the complex and long-range process of change involved in developing their capacity to maintain a high level of operation.

OVERALL GOALS

The basic goal of CCPP is to increase the number of minority students prepared to enter the University and to undertake a math-based major. This will be accomplished by assisting junior high and high schools with large numbers of minority students and relatively few college-bound students to 1) strengthen their basic college preparatory math programs in grades 7 through 12, and 2) increase the number of students taking college preparatory math in the 7th and 8th grades, algebra in the 9th grade, geometry in the 10th grade, advanced algebra/trigonometry in the 11th grade, and pre-calculus in the 12th grade. A long-range goal is to strengthen the overall capabilities of the schools, the district, and the community to maintain fully enrolled college preparatory programs consistent with University standards.

Research objectives of the program are to: 1) develop a greater understanding of the program implementation process and of the requirements for bringing about change in the schools, and 2) develop a model whereby school districts and their neighboring universities and colleges can work together to strengthen the schools' college preparatory programs.

THE CCPP MODEL

The school problems briefly outlined in the Introduction suggest that articulation across as well as within schools is a central problem. In order to achieve full articulation and to assure continuity for students, CCPP works simultaneously in the high schools and in the junior highs which send them students. As part of this systemwide approach, CCPP also works at the district level.

The CCPP model seeks to address unique problems of individual schools and to achieve uniformity across schools by means of two complementary processes. It provides resources and assistance for raising the level of the steady-state operation in each school and it brings together school faculty and staff across and within schools to identify problems and to plan solutions. Two central elements of the CCPP model--the CCPP Coordinator and the CCPP School-University Institute--are the means to effect these processes.

The CCPP Coordinator

The CCPP Coordinator is a professional math educator employed by the University who works with school faculty and staff in a collaborative, resource and advisory capacity on a daily basis at the school site to address the problems outlined in the Introduction.

Instructional Support

In order to stop further erosion of the curriculum and of the pyramid of prepared students caused by gaps in the students' backgrounds, the CCPP Coordinator provides two kinds of instructional support.

First, on the basis of a needs assessment, the Coordinator organizes instructional support for the teacher in the classroom. Support may be provided in varying degrees and combinations by the Coordinator, CCPP Instructors, UC graduate or undergraduate students in math-based fields, or

peer teachers who have been trained jointly by CCPP and school staff. Having more than one instructor in the classroom enables students to group according to preparation and ability and thus to move through the curriculum at a faster rate; makes it easier for individual students to get help with particular problems; and ultimately more actively involves students, making them more responsible for their own learning.

Second, the Coordinator works with school faculty and staff to set up advanced study groups before school and at lunch which provide students with additional instruction and peer group support. Instruction is provided by one or more of the agents who provide instructional support in the classroom, in collaboration with school faculty.

Assistance to Faculty and Staff

The Coordinator works intensively with teachers and counselors to properly identify and enroll students in the 7th and 8th grade college preparatory math classes so that they will be prepared to take algebra in the 9th grade. This effort usually includes identification and recruitment of 6th grade students in collaboration with elementary school staff. Special care is also taken to assure that the junior high school student is properly enrolled in the appropriate college preparatory courses in the high school.

The Coordinator also works in an advisory and resource capacity with school faculty and staff to strengthen the grades 7-12 college preparatory math program itself. The Coordinator works with individual teachers in class and in conference period to 1) establish pacing of the curriculum, 2) develop methods of evaluating students, 3) adjust and supplement the curriculum to meet students' needs, and 4) develop more effective instructional techniques; and with groups of teachers in department meetings to assist in articulating the curriculum. The Coordinator also assists counselors and administrators

at the school site to develop: 1) effective procedures for evaluating, counseling, and enrolling students; 2) more effective management practices; 3) methods of coordinating school and University programs; and 4) strategies for building and sustaining parent involvement.

The CCPP School-University Institute

The School-University Institute brings together faculty, staff, and key parents across schools; district staff; CCPP staff; and University faculty monthly during the school year at various school sites and for two weeks during the summer at the Lawrence Hall of Science. Work at the Institute generally falls into two parts. Participants work in mixed groups to identify problems and to plan and implement solutions in each school and in the schools as a system. Participants also meet in administrator, teacher, and counselor and parent groups to focus on more specific issues. Administrators work out ways of guiding the school change process and share successful practices. Teachers develop and monitor curriculum pacing and articulation, and share curriculum ideas and instructional techniques which they find particularly effective. Counselors and key parents work together to develop 1) ways of involving parents, and 2) parent awareness of school operations. On-site work in turn builds on the Institute. The Coordinator assists in the follow-up work required to implement plans formed at the Institute at the school sites and assists teachers to introduce curriculum ideas and instructional techniques developed at the Institute into particular classes.

Parent Involvement: The Interschool Parent Council
And Neighborhood Study Groups

In addition to participating at the Institute, parents are involved in developing an interschool parent council consisting of representatives from each participating school. Major roles of the council are to assist

individual schools to develop their parent involvement programs; to develop potential parent leadership, especially among parents of 6th and 7th grade students; and to strengthen the articulation between the elementary, junior high, and high school parent programs. It is hoped that the council will help build greater parent involvement in the high school program by providing an organizational framework and peer support group which will encourage parents to be involved for as long as their child is in school.

Parents are also being trained to organize, run, and supervise neighborhood study groups set up in homes surrounding a school. These groups are attended by the same students on a regularly scheduled basis for from one to three hours per week. Instruction in the groups complements instruction in the advanced study groups held at the school site and is directly related to what is going on in the classroom. It is provided by school peer teachers who are trained by CCPP staff at the school site to teach small groups. The neighborhood study groups are designed to be self-perpetuating, for parents are trained to train other parents to supervise groups and school staff are trained to train the peer teachers. The program is eventually maintained jointly by parents and school staff. Supervising neighborhood study groups provides parents with concrete roles in the instructional program. Their involvement can be adjusted to their schedules and interests. As parents who supervise neighborhood study groups begin to work together coordinating their groups, they have the opportunity to address and pursue other issues. It appears that the parents supervising the neighborhood study groups will become the core of the schools' parent involvement programs.

Autonomy through the School-University Collaboration

A common approach unites all of the elements of the CCPP model. The resources and assistance provided at the school site, the coordination of

Institute activities, and work with parents all take place within the framework of collaboration. Collaboration with the University will hopefully set in motion collaborative processes in and among the schools and the community that will enable them to maintain a high level of educational operation over the long term. It is thus a central aim of the CCPP collaboration that the district, the schools, and the community take over program components as early in the five-year period as possible. CCPP is concerned with institutionalization from the very first steps of planning and implementation. The goal of CCPP's work at the district level is to transfer program functions to district staff. By 1983-85, CCPP's role will begin to change into that of a primary resource to district staff, assisting them as they assume the role of working in the schools as CCPP staff did at the outset.

It is expected that by this time the level of the schools' steady-state operations will have been raised, so that the work being taken over will be the somewhat reduced work of maintaining this higher level. District staff will serve as advisors and resources to school faculty and staff along the lines of the CCPP Coordinator. The instructional support component of the program will be maintaining itself, for by the fifth year, peer teachers will have replaced program staff in the classroom and in study groups. The CCPP Coordinator will have trained 1) school math staff to train peer teachers, and 2) the school math resource teacher and the peer teachers themselves to maintain the peer teaching programs.

To abandon the Institute would be to invite many problems to recur. CCPP staff will assist in maintaining the Institute, but by 1983-85 teachers and district staff will assume leadership roles.

1981-82 INVOLVEMENT

A summary of past, present, and projected involvement of schools, teachers, counselors, administrators, and students is contained in Table 1 (p. 14).

Schools

CCPP operates in all eight secondary schools in East Oakland (see Figure 1, p. 15). These schools form a system in which it is possible to build high school classes in which all students (excepting those new to the District or open enrolling to the school) have been in the CCPP program in the junior high. Almost all of the students attending Castlemont High and five of the junior high schools are Black. At Fremont High and Hamilton Junior High approximately 60% of the students are Black, 33% are Chicanos, and 6% are other minorities. Together, these schools represent more than 40% of the city's junior high and high schools. In 1980-81, they supported the disproportionately small pyramid described in the Introduction and indicated in Table 2 (p. 21).

Teachers, Counselors, and Administrators

The most intensive work was done with 28 teachers who taught on-track classes. These teachers worked on a daily basis with CCPP staff and attended the monthly CCPP School-University Institute. Less intensive work was done with a second teacher population consisting of 23 math teachers who taught "near-track" classes (classes of students taking the college preparatory math courses one year late) and less advanced classes. These teachers met weekly with CCPP staff at the school and attended the CCPP School-University Institute. These two groups of teachers represented 80% of the schools' math teachers. The remaining teachers attended the Institute occasionally. CCPP also involved 17 counselors and 16 administrators from the schools

participating in the program. This group represented 61% of the school counselors, and 70% of the site administrators, all of whom worked with program staff weekly throughout the academic year and occasionally at the Institute. An additional 11 senior administrators and staff at the District office attended the Institute occasionally and met monthly with CCPP staff.

Students

In 1981-82, the program served 37 regular school classes containing 933 on-track students and 52 "near-track" students--a total of 985 students. In general, CCPP staff do not work in "near-track" classes, but work with their teachers, many of whom also teach on-track classes. "Near-track" students thus benefit indirectly from the program. They may also benefit directly by attending study groups held before and after school by CCPP and school staff.

Parents

A total of 16 parents, two from each school, were extensively involved in program planning and implementation activities. They attended the Institute and met on a weekly basis with program staff. Approximately 400 additional parents met occasionally with program staff.

Table 1

POPULATION SERVED
(Past, Present, and Projected)

	1980-81[1]	1981-82[2]	1982-83[2]	Projected[3] 1983-84	Projected[3] 1984-85
Schools	5	8	8	8	8
Teachers	20	51	53	53	53
Counselors	8	17	17	17	17
School Administrators	9	16	16	16	16
District Administrators	2	10	10	10	10
District Math Staff	1	1	6	6	6
TOTAL Faculty and Staff	40	95	102	102	102
Students					
On-track, grades 7-12	350	933	1100	1250	1360
Near-track, grades 9-12		52	90	100	100
TOTAL Students	350	985	1190	1350	1460

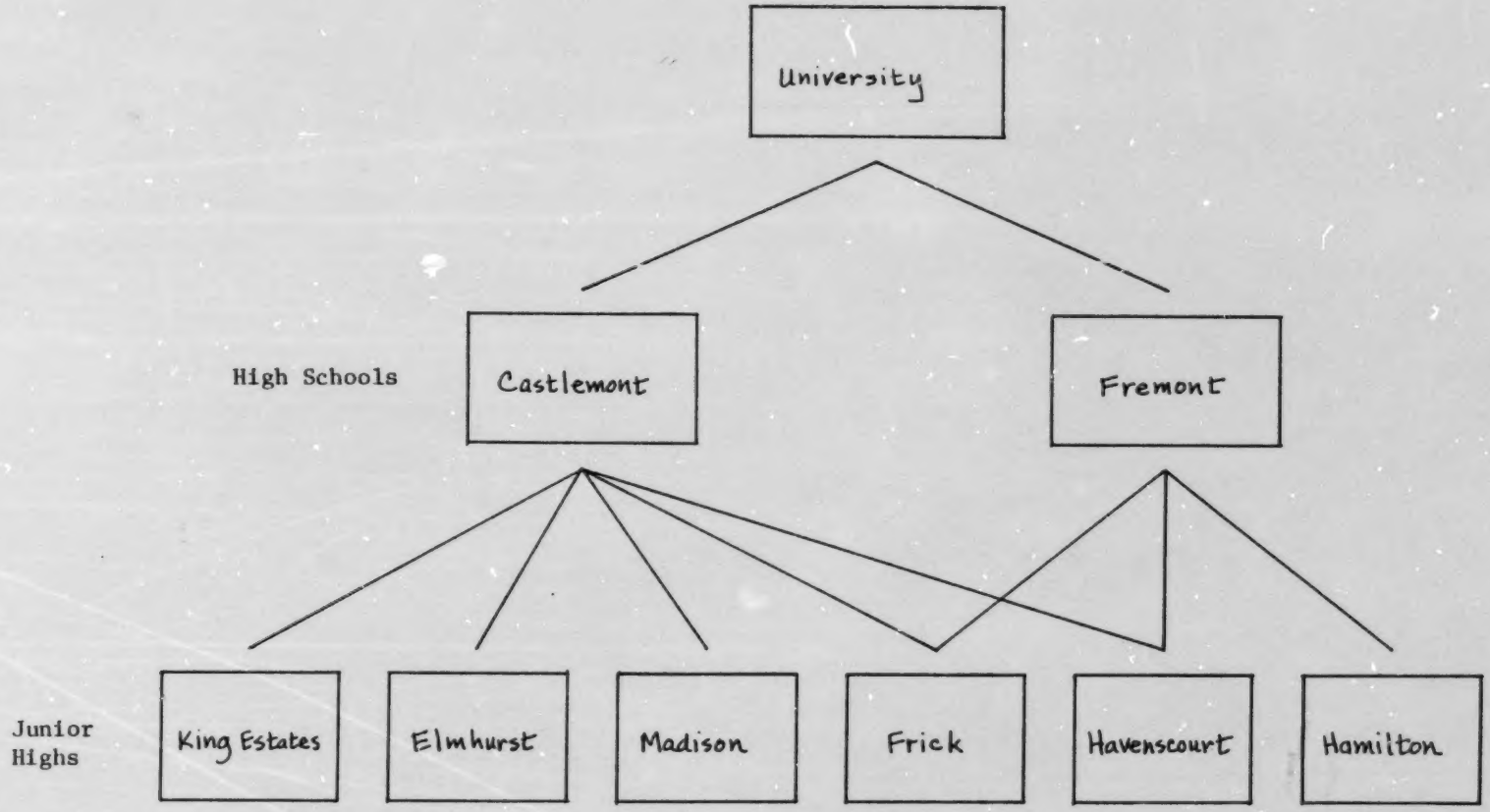
[1]Includes Castlemont, Fremont, Elmhurst, King Estates, and Hamilton.

[2]Includes Castlemont, Fremont, Elmhurst, Frick, Hamilton, Havenscourt, King Estates, and Madison.

[3]These projections do not include the project expansion currently being planned.

Figure 1

CCPP SCHOOLS 1981-82



SIGNS OF CHANGE

Program success will ultimately be indicated by 1) increases in the total numbers of minority students who enter four-year colleges and complete calculus in their freshman year and 2) a high level of performance by these students. Until sufficient data bearing on these measures is available the likelihood of program success can be gauged by examining changes in 1) enrollments in the college preparatory math courses through pre-calculus, in conjunction with changes in 2) grade distributions, 3) the level and standards of the courses and course tests, and 4) achievement and aptitude test scores (CTBS, PSAT, SAT, UC-CSU Math Diagnostic Test). Reports by school faculty and staff, parents, and students provide an additional perspective (see Appendix for a sampling).

Enrollment Increases

Thus far preliminary combined enrollment data for the six junior high schools and the two high schools show a significant increase in the number and percent of on-track students: those who took college preparatory math in the 7th and 8th grades, algebra in the 9th grade, geometry in the 10th grade, advanced algebra/trigonometry in the 11th grade, and pre-calculus in the 12th grade. This data is summarized in Tables 2 and 3 and Figures 2-5 (pp. 21-26).

1982-83 enrollment projections are based on pre-enrollment data and school grade level enrollment projections for September 1982. 1983-86 grade level enrollment projections are based on District grade-to-grade survivorship factors and anticipated CCPP course survivorship factors. It is estimated that beginning in September 1983, at least 80% of CCPP geometry students will go to college and at least 70% of the pre-calculus students will have the prerequisite skills to take calculus in their freshman year

of college. It is, of course, difficult to project enrollments; these projections should be looked upon as rough estimates which provide a time-table for enrollment changes.

It is important to note that these results do not include the "near-track" population: those students who are taking the college preparatory courses one year late. While CCPP does not work directly with the majority of "near-track" students, the number of these students too has grown. This growth indicates the beginnings of a ripple effect that is serving to increase the overall number of students taking advanced courses and thus becoming college-bound.

The 1981 and 1982 enrollments in the 7th and 8th grade college preparatory courses might be puzzling because more students were enrolled in the 8th than in the 7th grade courses. These unexpected results can be partially explained by CCPP's intensive identification efforts during 1980-81. Identification of talented 8th graders in the Fall semester produced larger 8th grade college preparatory enrollments in the Spring semester (June 1981 figure). Identification of talented 7th graders throughout the year produced larger 8th grade college preparatory enrollments in 1981-82 (June 1982 figure). The larger 7th grade enrollment in September 1982 may be attributed to the initiation of efforts to identify and recruit talented 6th graders in 1981-82.

The apparently very high attrition between the 9th and 10th graders is not as severe as it appears, for the data reflects only the number of CCPP-trained students attending CCPP schools. For example, in Fall of 1982 approximately 30 CCPP 9th grade algebra students who lived in the attendance areas of non-CCPP high schools went to those schools. Thirty additional 9th grade algebra students chose not to go to Castlemont or Fremont, but through

the District's open enrollment policy, to go to Skyline or Oakland High. The 1982-83 pre-enrollment of CCPP 10th graders in geometry district-wide is thus estimated to be 150 students. In the long run it is hoped that an improved program will lead to a more positive academic image for Castlemont and Fremont that will, in turn, curb the flight of talented students to other schools and ultimately lead to even more students attending advanced classes at Castlemont and Fremont.

Building the Pyramid

Figures 2 and 3 give a sense of the growth from year to year of the math course enrollment pyramid. They indicate a future increase in the absolute numbers of students in on-track courses and a greater percentage of students per grade level enrolled in on-track courses.

Tables 2 and 3 provide enrollment data for 1980-82, 1982-83 pre-enrollment data, and 1983-86 enrollment projections. This data indicates that the math course enrollment pyramid is developing on schedule and that by 1984-85 the projected pyramid of on-track students at both high schools should be in place. Conservative estimates indicate each school will have by this time at least three classes totalling at least 85 students taking geometry in the 10th grade, two classes totalling at least 60 students taking advanced algebra/trigonometry in the 11th grade, and at least one class of 30 students taking pre-calculus in the 12th grade.

It is expected that the pyramid will continue to fill out at the high schools and will yield approximately 50 pre-calculus students per high school by 1985-86. It is also expected that most of these students will go to competitive colleges and universities and that at least 70 (of the 102) will qualify to take calculus in their freshman year and be able to enter math-based fields. Again, it should be emphasized that this analysis does not

include the students taking advanced algebra/trigonometry one year late. Including these students, it is expected that by 1985-86 each high school will be graduating at least 100 students per year who will have completed advanced algebra/trigonometry or pre-calculus.

Timetable for Change

Tables 2 and 3 and Figures 4 and 5 suggest that we can expect different kinds of changes to occur during the five-year period. During 1980-83 we have had and expect relatively large gains in enrollments in the 7th, 8th, and 9th grades. At the same time, we find small gains in absolute numbers in the 10th through 12th grade population (the relative gains, however, are quite large). Then, between 1983 and 1985, the situation reverses. In this period we look forward to small fluctuations in the junior high enrollments, and large increases in enrollments in the high school courses. We expect the immediately large gains in enrollments in the junior high as a result of efforts to develop methods of identifying and enrolling students in the first two years of the program. The later, relatively constant enrollment levels in the junior high college preparatory classes, especially for the 7th and 8th grade classes, indicate the schools' ongoing capability to maintain these methods. The later increases in enrollments in the high school college preparatory classes are expected to result from efforts to strengthen courses and standards and to be accompanied by improved performance on standardized tests by students in these classes. Thus, while success is indicated in 1980-83 by changes in junior high enrollment, in 1983-86 we must turn increasingly to examine enrollment increases and test scores at the high school level. In general, we expect a gradual and perhaps accelerated improvement in test scores as students have been in the program for longer periods of time.

Building the Base of the Pyramid

The enrollment figures shown in Tables 2 and 3 suggest that by 1983 the junior high schools will reach a plateau (approximately 25% of 7th and 8th graders in on-track math classes and 18% of 9th graders in algebra). At this point, the most obvious way that the schools' college-bound population could increase would be through increases in the numbers of elementary school students prepared to enter the college preparatory sequence in the junior highs. Such increases might be achieved by expanding the CCPP effort to the elementary schools.

The potential impact of working at the elementary level is great. If, for example, each of the approximately 20 elementary schools sending students to CCPP junior high schools yielded only nine more students in 1983-84, the base of the pyramid--that is, enrollments in 7th grade college preparatory classes--would increase by 50%. In turn, significant increases in the numbers of 9th graders taking algebra would be expected.

On the one hand, then, we must be aware as we look for change that there may be a limit to the number of students who take on-track classes. On the other hand, a strategy for strengthening the K-12 program emerges: we must start by working at the junior high level and then work downward grade by grade through the elementary school. By proceeding in this way, we can assure continuity for students and maintain articulation of elementary, junior high, and high school programs in a systematic manner.

Table 2

COOPERATIVE COLLEGE PREPARATORY PROGRAM (CCPP)

Preliminary Enrollment Data and Enrollment Projections of

On-Track Students as of June 1982[1]

Grade	Course	Number of Students					
		Enrollment June 1981	Enrollment June 1982	Pre-enrollment September 82	Projected Enrollments		
					83-84	84-85	85-86
7	College Preparatory Math 1	165	292	360	360	360	360
8	College Preparatory Math 2	178	323	335	360	360	360
9	Algebra	114	215	250	270	290	290
10	Geometry	36	60	90	150	170	193
11	Advanced Algebra/ Trigonometry	21	30	45	72	120	136
12	Pre-calculus	3	13	22	40	61	102
College Entrance[2]			3	11	29	48	77
College Calculus				8	15	28	42

[1]Combined data for Castlemont, Fremont, Elmhurst, Hamilton, Havenscourt, Frick, King Estates, and Madison.

[2]Projections are for the number of CCPP Geometry students expected to go to highly competitive four-year colleges.

Table 3

COOPERATIVE COLLEGE PREPARATORY PROGRAM (CCPP)

Preliminary Enrollment Data and Enrollment Projections of

On-Track students as of June 1982[1] (in percent)

Grade	Course	% of Students/Grade				
		% Enrollment June 1981	% Enrollment June 1982	% Pre-enrollment Sept. 82[2]	Projected % Enrollment	
					Sept. 83	Sept. 84
7	College Preparatory Math 1	12.1	20.7	22.2	25.0	25.0
8	College Preparatory Math 2	12.6	25.1	22.2	25.0	25.0
9	Algebra	8.7	17.9	19.0	17.8	17.9
10	Geometry	2.8	5.0	7.5	11.4	11.2
11	Advanced Algebra/ Trigonometry	1.9	2.8	4.8	6.3	9.6
12	Pre-calculus	.4	1.7	2.3	4.7	5.8

[1] Combined data for Castlemont, Fremont, Elmhurst, Hamilton, Havenscourt, Frick, King Estates, and Madison.

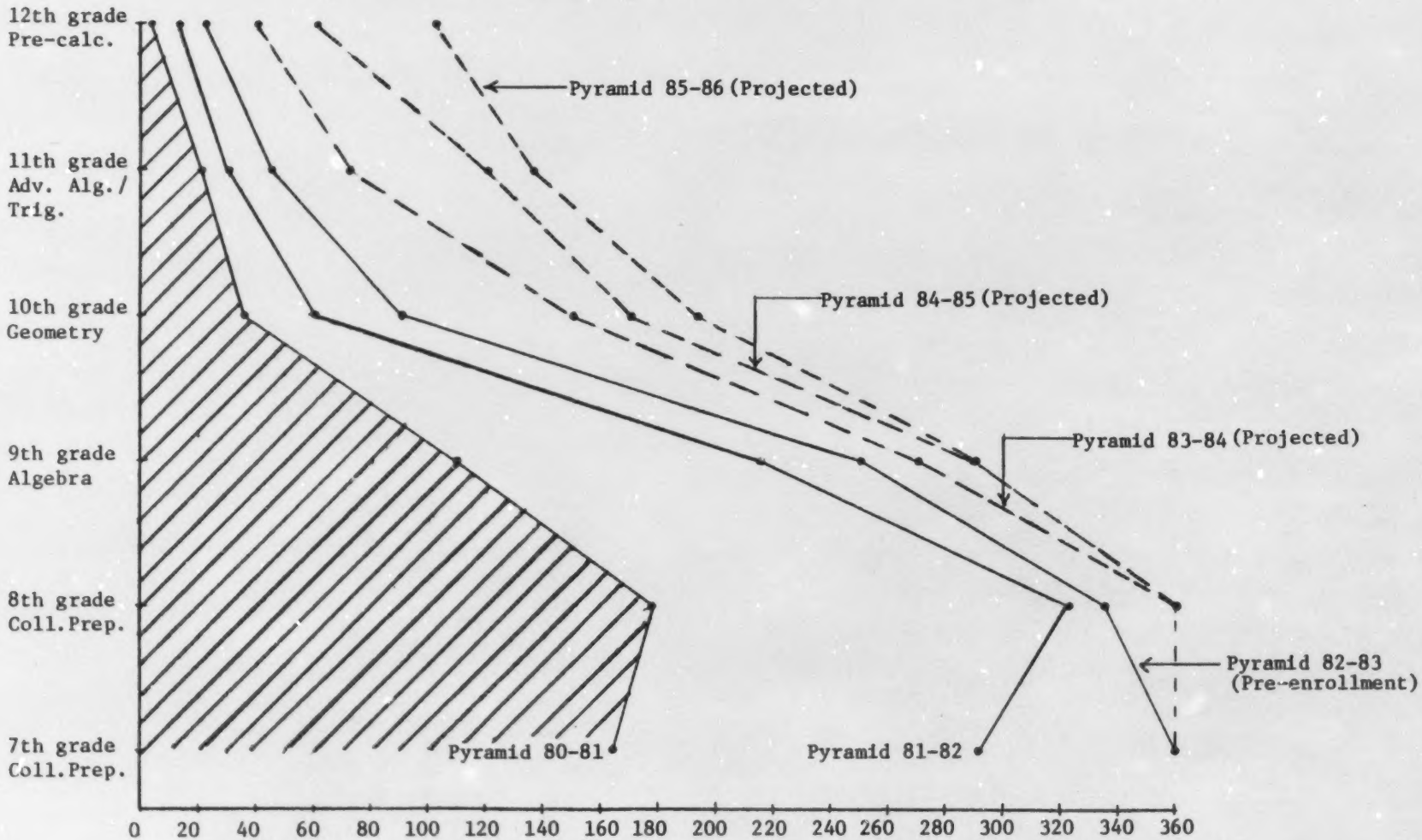
[2] $\frac{\text{Pre-enrollment in CCPP classes}}{\text{Projected grade level enrollment}}$

Figure 2

COOPERATIVE COLLEGE PREPARATORY PROGRAM (CCPP)

Preliminary Enrollment Data and Enrollment Projections as of June 1982*

Pyramids of On-Track Enrollment for the Period 1980-86


12th grade Pre-calc.
11th grade Adv. Alg./ Trig.
10th grade Geometry
9th grade Algebra
8th grade Coll. Prep.
7th grade Coll. Prep.
Pyramid 85-86 (Projected)
Pyramid 84-85 (Projected)
Pyramid 83-84 (Projected)
Pyramid 82-83 (Pre-enrollment)
Pyramid 81-82
Pyramid 80-81
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360
Number of students/grade taking college preparatory math courses on-track

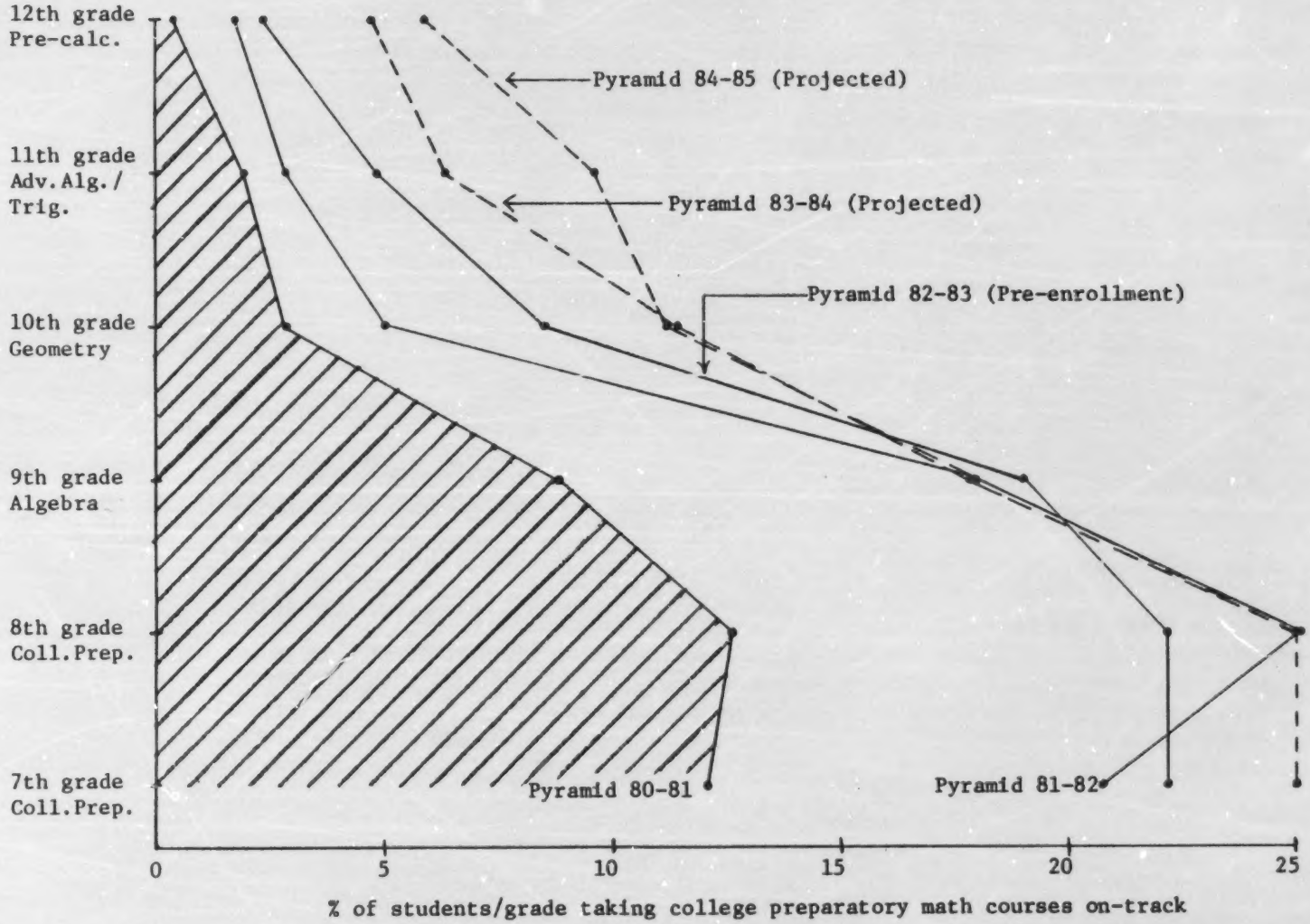
*Combined enrollment data for Castlemont, Fremont, Elmhurst, Hamilton, Havenscourt, Frick, King Estates, and Madison.

Figure 3

COOPERATIVE COLLEGE PREPARATORY PROGRAM (CCPP)

Preliminary Enrollment Data and Enrollment Projections as of June 1982*

Pyramids of On-Track Enrollment for the Period 1980-85 (in percent)



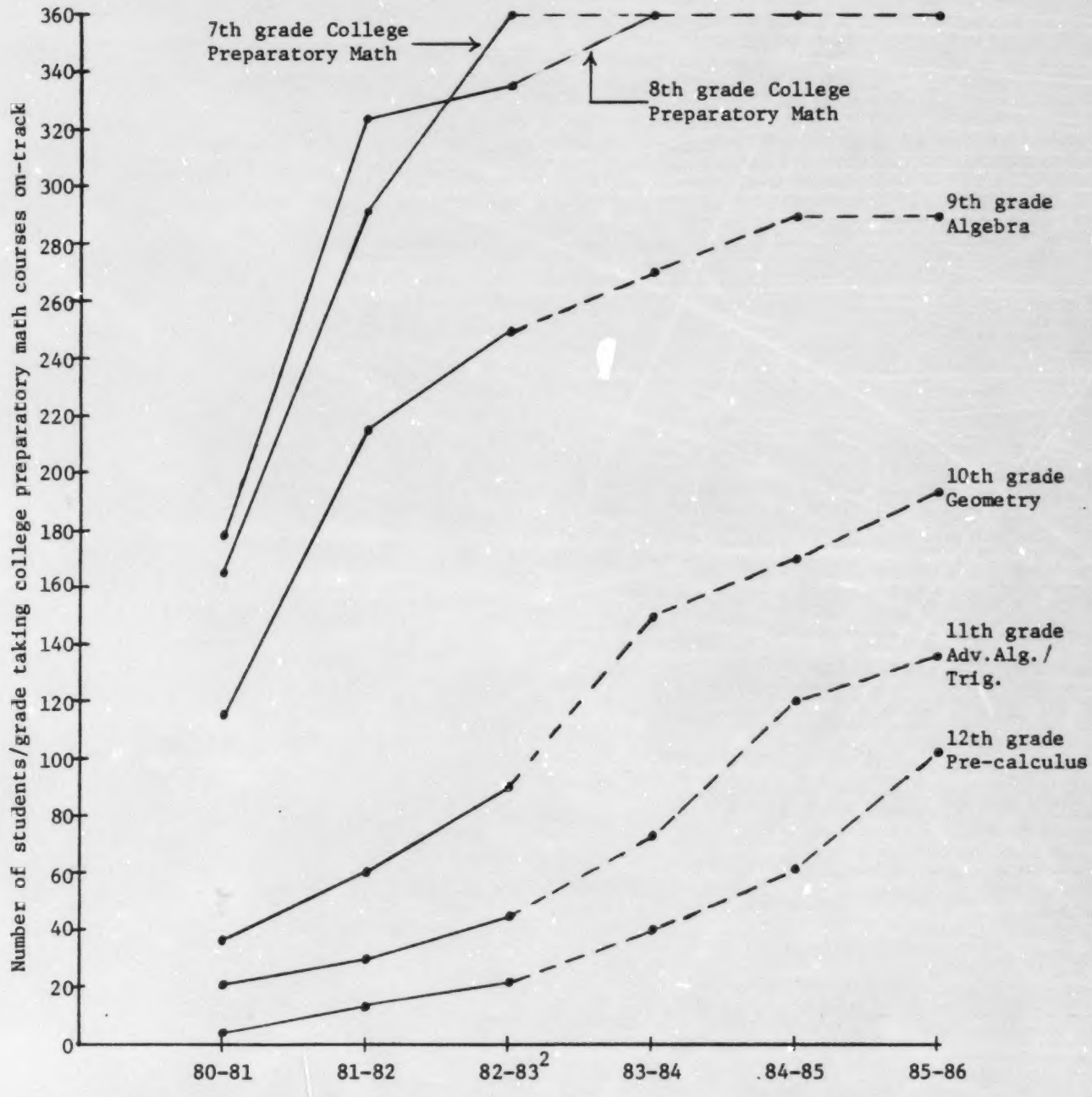
*Combined data for Castlemont, Fremont, Elmhurst, Hamilton, Havenscourt, Frick, King Estates, and Madison.

Figure 4

COOPERATIVE COLLEGE PREPARATORY PROGRAM (CCPP)

Preliminary Enrollment Data and Enrollment Projections as of June 1982[1]

On-Track Course Enrollment Trends 1980-86



[1]Combined data for Castlemont, Fremont, Elmhurst, Hamilton, Havenscourt, Frick, King Estates, and Madison.

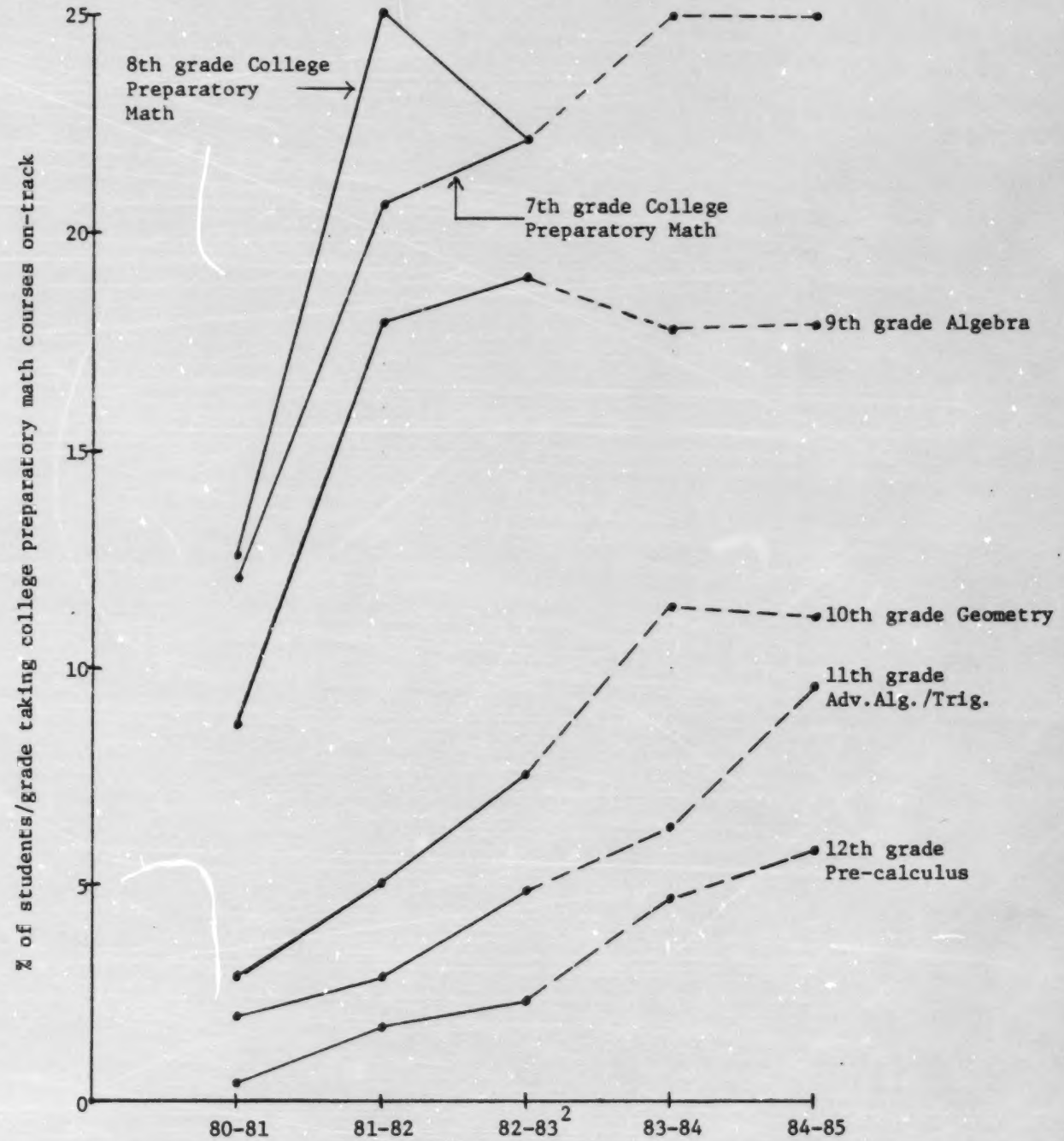
[2]Pre-enrollment.

Figure 5

COOPERATIVE COLLEGE PREPARATORY PROGRAM (CCPP)

Preliminary Enrollment Data and Enrollment Projections as of June 1982[1]

On-Track Course Enrollment Trends 1980-85 (in percent)



[1]Combined data for Castlemont, Fremont, Elmhurst, Hamilton, Havenscourt, Frick, King Estates, and Madison.

[2]Pre-enrollment.

Improved Courses and Higher Standards

The significance of the increases in enrollments is corroborated by three other factors. First, students were selected for these classes on the basis of criteria at least as stringent as those used in the previous year. The large increases in enrollments are a result of the increased time spent finding qualified students and the increased care taken to make sure that these students were actually enrolled in their classes. Second, the courses were stronger. For example, at least 50% more material was taught in most of the algebra classes and some teachers virtually doubled the amount taught. And third, standards were raised. Seventy percent (80) of the students received a grade of C or better in algebra in 1980-81 and only 67% (143) of the students received a grade of C or better in 1981-82. This trend was corroborated by the fact that algebra teachers felt that the tests given were more comprehensive and more difficult than in the previous year and that grading standards were higher. This apparent strengthening of standards may be attributed to a new commitment among teachers not to let unprepared students slip through--a tough-mindedness developed in reaction to the attention CCPP brought to the quality of standards.

Another indication that standards in CCPP courses were close to University expectations was provided by the scores of CCPP advanced algebra and pre-calculus students on the UC-CSU Math Diagnostic Test. The test was given in part to obtain an objective measure of grading standards in CCPP classes and it was given to all students in CCPP advanced algebra/trigonometry and pre-calculus classes. At least 60% of the students in these classes achieved mastery level, i.e., had the prerequisite skills to take pre-calculus or calculus. Furthermore, it turned out that 1) every student who achieved mastery level on the test received a grade of C or better with

the A students tending to score highest, B students next highest, and the C students scoring less than all the A and B students; and 2) no student who received less than a C achieved mastery level. The test scores parallelled grades given by teachers, thus suggesting that the teachers' standards were in line with the University's standards.

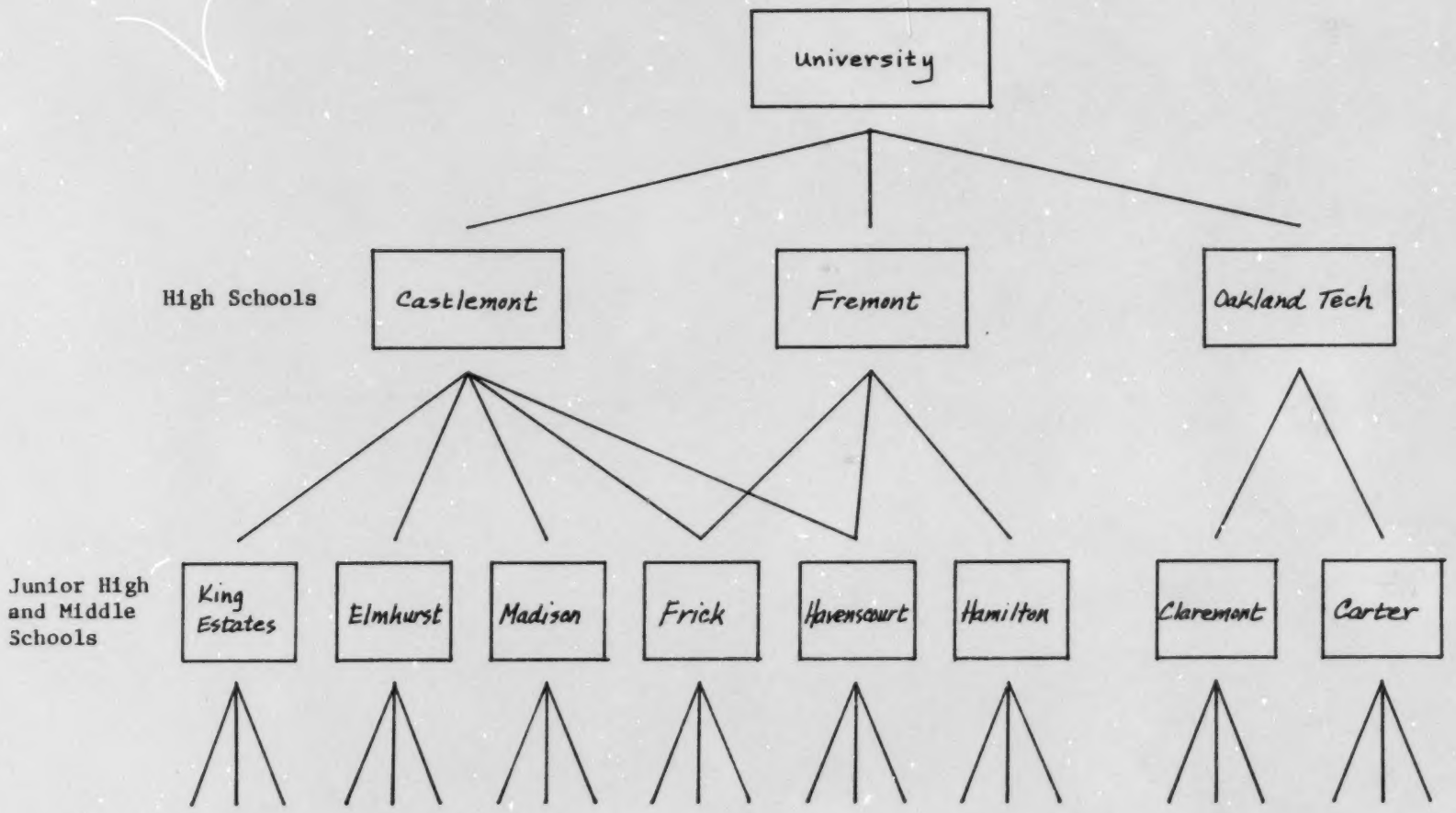
That higher standards were in effect in all CCPP classes was suggested by three checks: 1) constant review and discussion of standards and tests among teachers teaching the same course; 2) constant review and discussion of standards and prerequisites among teachers teaching sequential courses, for example, algebra and geometry; and 3) constant review with teachers by CCPP staff, who bring the perspectives of other schools and University standards. Standards on each grade level were monitored by teachers on that level and the next grade level and with respect to an outside reference.

SIGNS OF ACCEPTANCE AND INSTITUTIONALIZATION

The District has asked CCPP 1) to expand to three secondary schools in North Oakland: Oakland Technical High, Carter Middle School, and Claremont Junior High School (see Figure 6, p. 30); 2) to introduce CCPP methods to elementary schools throughout the District; and 3) to assist district-wide math staff to train math resource teachers and administrators at individual school sites to implement and maintain CCPP through a combination of math workshops and apprenticeships with CCPP staff. This expansion and institutionalization of CCPP is a joint effort of CCPP and the Superintendent's Office. It is fully coordinated with the District's overall plans to strengthen the schools through a reorganization and redistribution of staff and teaching resources. An initial allocation of $10,000 by the District in 1982-83 will be aimed at training teachers, counselors, and administrators to implement CCPP methods and to maintain the program. This expansion represents a major step toward the institutionalization of the program, for the District-CCPP training effort will put in place all the machinery necessary to maintain and monitor the program.

Figure 6

CCPP SECONDARY SCHOOL EXPANSION



Short-Term Investment for a Long-Term Payoff

Costs for CCPP over the five-year transition period are looked at as development and investment costs aimed at 1) strengthening the overall capability of the schools to prepare students for four-year colleges, and 2) strengthening the overall capability of the District to assist the schools in maintaining their improved level of operations. The payoff is long-range and cannot be looked at solely in terms of increments in the numbers of on-track students prepared to enter college during the transition period. Instead, the real payoff is seen to be in an overall improvement of the schools and their increased productivity over a ten-year period. It is expected that between 1985 and 1990 1) the schools will maintain enrollments in on- and near-track classes at at least 1984-85 levels, and that 2) there will be a steady increase in the number and percent of students entering college and math-based fields and taking calculus in their freshman year. During this second five-year period, program costs are expected to be significantly reduced, being limited to assisting the District to maintain and monitor the program throughout the District. Consequently, in these later years cost per student would be expected to decrease additionally.

Table 4

Funding History/Cost Summary

	1980-81	1981-82	1982-83
UC	$190,500	$263,500	$245,000
San Francisco Foundation		36,500	63,500
Bechtel Corporation			10,000
Oakland School District (for program expansion)[1]			10,000
Total Secondary (without expansion)[2]	$190,500	$300,000	$318,500
Cost/Student[2]	$ 544	$ 305	$ 268

[1]For training for District staff to implement and maintain CCPP and to initiate CCPP expansion to three North Oakland Schools: Oakland Technical High School, Claremont Junior High School, and Carter Middle School.

[2]For Castlemont and Fremont High Schools and Elmhurst, Frick, Hamilton, Havenscourt, King Estates, and Madison Junior High Schools.

APPENDIX

Administrator, Teacher, Counselor, and Parent Responses to CCPP

The District's response to the program has been very positive. Superintendent Bowick has stated that:

> . Oakland will use CCPP methods throughout the District to assist in the revitalization of our schools.

In addition, the Superintendent has asked CCPP to assist in this revitalization process. The feelings of several administrators in the District toward CCPP are captured in this observation by Harold Zuckerman, the Director of the North Oakland School revitalization effort:

> . CCPP is the most valid program I have seen because it responds directly to the needs of the teachers in helping them develop their programs.

The teachers', counselors', and parents' responses to CCPP have been extremely positive. All participants at the last session of the CCPP School-University Institute on July 1, 1982 were asked: How has CCPP affected you? The group included 26 of the 28 teachers of on-track classes, 17 of the 23 teachers of "near-track" classes, four parents, and four counselors. Forty-seven of the 51 participants responded and four did not. All of their responses are listed below.

> . I see myself (counselor) as being a liaison between teacher and students and parents. The program has given me a greater insight of my role and how I can best serve students. It has helped in programming students for the right math courses, i.e., Honors (Algebra), General Math, Math Workshops.
>
> . It helps me to focus upon identifying student learning needs more effectively. I could easily be lulled into skipping over some of these needs if it weren't for the fact that a team of professionals were constantly involved in making this process work, both for teachers and students.
>
> . I have observed students working at levels that they perhaps would not have been had it not been for CCPP. This has caused a deep appreciation and respect for CCPP on my part.

. I have become more aware of what is needed in future courses the student might take and have concentrated on these in my classes.

. Tremendously--I think the program has increased my teaching skills and increased my knowledge of areas I was not too comfortable with.

. Teaching style now somewhat limited but changes have been positive.

. The program has motivated me to stress the important aspects of the program to the students and to get them involved in doing their best at all times.

. To identify some of the problems of teaching math.

. I feel I am becoming a much better teacher. My students are not suffering as much because of my deficiencies in the brain department.

. The program has given me an opportunity to share and receive ideas that with the proper implementation can help me to help my students in all classes.

. We are establishing a focus for math/science that is necessary since we are dealing with a very low academic environment.

. Re-affirmed my faith in UCB and its commitment to the people, the inner-city disadvantaged, and realistic teaching. Helped remove nagging doubts as to quality of Oakland teaching of math. Balanced my hopes that CCPP will continue to help.

. The program has been most enlightening. I have become most convinced that a program of the nature of the CCPP program is needed. However, I have serious reservations that the program can be successful in its current structure. I think.

. Made my plans for the year easier.

. The program has given me a new sense of hope and expectation.

. It gives me insight on what the program is all about.

. It has made me aware of some of the existing school problems.

. This institute has made me comfortable in my ability to transmit information back to my school.

. The Program has shown me that changes for the better are possible when there is capable leadership. This leadership should come from the District rather than from the University. The program has given me a better understanding of how to direct students.

. The way the program has affected me is overwhelming. I enjoyed being involved in this program very much and hope to continue my involvement as long as I am called upon.

. I have a clearer understanding of the needs of math students as well as the teachers.

. Will incorporate more math teaching techniques in my classes.

. CCPP has given me the assurance that my concerns are not by themselves and that there are others that feel as I do about the education of students.

. I learned some new teaching strategies and materials that would make teaching or lesson presentation easier for me.

. The program has not affected me directly, but given me aims of the program and the benefits to the student, in the long run it will affect all the teachers positively.

. This program has been informative and giving me the stamina to want to become involved as a parent to try and help with the home study groups and encourage other students to increase their learning abilities.

. This program gives hope to all minority students. This also gives positive vibrations for continuing education. In short the standards are being set and set high to motivate the students who are participating and I feel will encourage more to become interested in.

. Raised my mathematical consciousness and supplied me with additional tools to serve my students better.

. Made me aware of many student needs.

. It has given me insight on different ways to increase parents' participation in their children's education and major contact with teachers and counselors.

. Helped me appreciate the University's attempt to bring about meaningful changes in the community (without being paternal).

. Understand the staff and their problems at school sites. Other ways to get parents involved in the schools.

. Feel good about chance for improved schools.

. Has made me see more of the school problems that exists and the number of teachers, counselors, parents, and CCPP staff that are concerned.

. To be seen later. No actually it has fostered better communication between staff and parents, other staff and staff.

. It caused me to have a greater insight on things concerning the school and students.

- I will try to improve my instruction in the future in all of my classes.
- It has encouraged me to be more vocal with my peers about the aspects of the programs.
- It has made me more concerned about students who have the skills who are not in the program.
- Change in teaching style for CCPP classes, also slightly in other classes--less lecture and more class work.
- It gave me a different perspective of the programs that schools have to offer.
- Being new to the program I can't answer.
- Very positively. Through the institute, I see more of a need to build our curriculum from top-down as opposed to bottom-up. Basically I am saying that we need to identify where we want our students to be at the top levels, then build curriculum at lower levels to prepare them to reach the set goal.
- As an educator, it has provided me with academic skills to take back to the school site.
- To be open and stick to the basics.
- Although I think that I am well-organized the institute allowed me to expand my classroom management skills and skills in the organization of curriculum.
- Given us some unification to get help from administrators and counselors.